FOUNDATION FOR
Health Care Quality
CARDIAC CARE OUTCOMES
ASSESSMENT PROGRAM (COAP)

Final COAP Report:
Regional PCI Bleeding Reduction Initiative

THANK YOU *to all physicians, clinicians, quality improvement professionals and administrators who participated in COAP's 3-year initiative to reduce bleeding events post PCI. While individual physician level reporting culminates with 2024 data, COAP continues to track risk-adjusted bleeding rates, transfusion post PCI, and radial access PCI as part of our standard reporting, and hospitals will continue to be benchmarked on these metrics. This report summarizes the PCI Bleeding Reduction Initiative details and progress.*

Why the Initiative?

- Bleeding is associated with 3-fold increase in mortality after PCI
- Post-PCI bleeding is associated with higher costs of care (~$8,000 for major bleeding)
- There are evidence-based strategies to reduce bleeding risk
- COAP bleeding and transfusion rates are higher than national averages.

Kwok et al. Circ CI. 2015
Tamez et al. CCI. 2018

Initiative Timeline:

- Baseline data: 2020
- Initiative launched October 2021
- Three full years of data since launch: 2022-2024

Initiative Supports:

- Semi-annual blinded Physician-level Bleeding Reports to all PCI Operators with > 10 PCI volumes with best practice recommendations
- COAP Regional Meeting/Webinars with data and best practice sharing
- COAP coordination of facilitated learning with peer physicians

COAP Regional PCI Bleeding Reduction Initiative Goals:

Promote bleeding reduction best practices

1) Increase rates of radial access for STEMI by 10% within 1 year
2) Decrease routine use of GP IIb/IIIa inhibitors by 5% within 1 year

Reduce overall bleeding and transfusion rates

3) Decrease rates of risk adjusted post-PCI bleeding by 10% within 1 year and 25% within 3 years
4) Decrease post-PCI transfusion (within 72 hours) by 5% within 1 year

The importance of bleeding

Bleeding is common after PCI and is associated with a 3-fold increase in mortality and major adverse cardiovascular events. Blood transfusion after PCI is also independently associated with mortality. The complexity and acuity of PCI patients in Washington State is increasing, leading to greater risk of bleeding. However, bleeding risk is modifiable with interventions before, during, and after the PCI procedure.

How are COAP hospitals doing?

Bleeding rates among COAP hospitals are worse than the national average. Like the rest of the country, COAP hospitals have made marked gains in radial access use and reduction of bleeding over the past decade. Most hospitals now have an O/E ratio <1 for risk-adjusted bleeding, reflecting impressive gains since the risk model was developed. However, there is still room to improve.

Calculate and plan

Patients at highest risk for bleeding are *least* likely to receive bleeding prevention techniques. This "Risk-Treatment Paradox" can be avoided by routine assessment of bleeding risk. Patients at highest risk of bleeding or with baseline anemia may benefit from pre-PCI optimization and consideration of the bleeding avoidance strategies described below. Online risk calculators are available from ACC and SCAI.

Safe access sites

Transradial access reduces bleeding events and may improve survival for patients with STEMI, compared with femoral access. COAP sites with "radial first" practice routinely achieve transradial rates over 80%. Recently, bleeding rates have declined nationally for both radial and femoral access, potentially reflecting increasing attention on bleeding avoidance and "safe femoral" techniques such as ultrasound guidance. While femoral artery closure devices have not been definitively shown to reduce bleeding, they can be considered by experienced operators when femoral access is required.

COAP Best Practice Recommendations

1) Perform a formal bleeding risk assessment for all patients, including the use of a risk calculator when feasible
2) Use transradial access when possible, especially for high bleeding risk patients such as patients with STEMI
3) Avoid routine use of GP IIb/IIIa inhibitors
4) Avoid blood transfusions for stable patients with Hb > 8 g/dl
5) Consider shorter duration of DAPT therapy for high bleeding risk patients receiving current-generation drug-eluting stents for stable ischemic disease

Procedural anticoagulants and antiplatelets

Earlier data showed bivalirudin was superior to the combination of heparin and a GP IIb/IIIa inhibitor for bleeding avoidance, and more recent studies have shown similar outcomes among patients treated with bivalirudin vs. heparin alone. For this reason, routine use of GP IIb/IIIa inhibitors is discouraged. Bivalirudin may be considered for patients at high bleeding risk, especially if femoral access is used.

Post-PCI transfusions

While transfusions may be life-saving in the setting of acute bleeding, shock, or ongoing ischemia, transfusions should be avoided for stable patients. Transfusion thresholds are controversial and based on limited data, but a restrictive threshold of Hb <8 g/dl appears to be safe compared with <10 g/dl among CAD patients.

Long-term therapy

Dual anti-platelet therapy for 3-6 months after PCI is safe for contemporary drug-eluting stents, but patients with MI or high anatomic complexity may benefit from longer DAPT. Recommendations for post-PCI therapy should be tailored to patient risk. The DAPT and PRECISEDAPT risk scores have online calculators. In addition, several DES have shown superiority to BMS for high-bleeding risk patients with planned DAPT of 1 month; there may be limited role for BMS in contemporary practice. Finally, for patients with afib or venous thromboembolism, use of an anticoagulant and P2Y12 inhibitor is superior to "triple therapy" also including aspirin.

Links, Resources, and References:

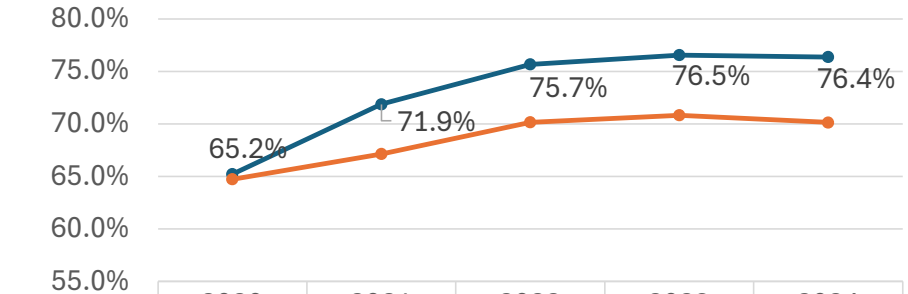
ACC Reduce the Risk Toolkit
ACC CathPCI Bleeding Risk Calculator
Precise DAPT Score Calculator
High Bleeding Risk Definitions | Circulation
Bleeding and Mortality Systematic Review
Blood Transfusion and PCI Systematic Review
Bleeding Avoidance Strategies | Nature Reviews
Transfusion Thresholds RCT | JAMA
ACC/AHA DAPT Guideline | Circulation
ACC Expert Consensus Anticoagulants and Antiplatelets

Site Level Outcomes 2020 vs 2024

	2020 All PCI Vol.	2024 All PCI Vol.	2020 Risk adjusted bleeding rate	2024 Risk adjusted bleeding rate	2020 Transfusion post-PCI	2024 Transfusion post-PCI	2020 Radial Access All PCI	2024 Radial Access All PCI	2020 Radial Access STEMI	2024 Radial Access STEMI	2020 IIb/IIIa Use	2024 IIb/IIIa Use
Central WA	374	328	0.5%	3.7%	0.00%	0.64%	82.4%	86.9%	78.4%	88.3%	14.7%	5.5%
Evergreen	442	471	0.4%	1.4%	0.00%	0.22%	85.5%	92.6%	83.0%	89.5%	2.5%	5.3%
***Harbor Regional**	0	75		0.0%		0.00%		77.3%		70.6%		17.3%
MHS Auburn	135	218	5.1%	1.5%	0.76%	0.48%	72.6%	82.1%	63.6%	77.0%	44.4%	9.6%
MHS Capital	77	210	0.0%	0.0%	0.00%	0.48%	88.3%	75.7%	75.0%	68.4%	10.4%	3.6%
MHS Deaconess	480	692	5.7%	2.7%	0.44%	0.15%	65.2%	84.5%	47.4%	84.1%	2.7%	1.3%
MHS Good Samaritan	332	376	6.2%	1.6%	0.62%	0.00%	75.9%	78.2%	68.5%	86.1%	49.7%	11.2%
MHS Tacoma General	605	532	8.6%	3.9%	0.73%	0.20%	59.0%	62.6%	64.5%	74.2%	21.3%	5.1%
MHS Yakima Memorial	324	436	5.9%	3.3%	1.98%	0.24%	17.3%	62.4%	7.1%	58.3%	88.0%	21.1%
Overlake	419	501	4.5%	4.9%	0.25%	0.64%	78.5%	62.9%	75.7%	68.3%	0.5%	0.8%
PH Sacred Heart	618	776	3.3%	4.2%	0.51%	0.14%	63.4%	71.0%	74.4%	69.8%	1.0%	3.9%
PH Southwest	609	619	1.8%	2.3%	0.00%	0.52%	73.2%	73.5%	69.9%	71.7%	5.1%	3.2%
PH St. John	184	277	4.6%	1.7%	2.27%	0.00%	91.3%	91.0%	100.0%	100.0%	4.3%	3.2%
PH St. Joseph	621	767	4.8%	3.4%	0.17%	0.55%	38.3%	49.3%	54.4%	65.9%	22.9%	6.0%
Prov Everett	898	1135	1.7%	2.4%	0.48%	0.38%	59.1%	73.4%	60.6%	79.8%	3.7%	2.3%
Prov Kadlec	648	757	2.6%	1.2%	0.82%	0.28%	65.6%	79.4%	61.2%	87.2%	27.8%	16.6%
Prov Sacred Heart	1025	826	4.2%	5.3%	0.31%	0.79%	71.5%	81.2%	75.3%	84.8%	1.5%	0.6%
Prov St. Mary	200	301	4.6%	5.4%	1.08%	1.37%	70.5%	71.8%	76.5%	73.8%	22.0%	22.3%
Prov St. Peter	907	1208	5.3%	4.3%	0.94%	0.53%	62.8%	58.6%	73.7%	70.7%	6.9%	4.7%
Prov Swedish CH	688	1067	5.2%	4.8%	0.64%	0.64%	72.4%	65.3%	69.8%	67.4%	9.7%	4.1%
Prov Swedish Ed	211	336	8.5%	2.2%	0.00%	0.96%	74.4%	67.0%	68.4%	70.9%	21.8%	14.0%
Prov Swedish Iss	110	150	4.3%	5.3%	0.00%	0.00%	90.9%	84.7%	88.9%	84.0%	30.9%	20.0%
Skagit Valley	281	257	1.8%	2.4%	0.37%	0.00%	30.2%	36.6%	17.7%	25.4%	3.6%	3.1%
UWMC Montlake	881	1001	7.8%	4.3%	0.55%	0.56%	36.2%	32.5%	72.0%	68.8%	0.7%	0.2%
UWMC Northwest	183	268	2.4%	2.9%	0.00%	0.40%	78.7%	85.1%	68.8%	82.4%	8.2%	1.1%
UWM Harborview	94	130	3.6%	4.7%	0.00%	0.89%	67.0%	75.4%	66.7%	75.7%	7.4%	10.0%
UWM Valley	262	357	6.4%	4.3%	0.79%	0.30%	28.6%	76.2%	3.8%	74.3%	38.5%	21.6%
VMFH St. Anne	126	49	2.8%	0.0%	0.80%	0.00%	84.9%	89.8%	81.3%	83.3%	26.2%	10.2%
VMFH St. Francis	240	261	2.3%	2.5%	0.43%	0.79%	81.3%	89.7%	89.7%	83.1%	11.7%	8.4%
VMFH St. Joseph	647	579	5.7%	1.2%	0.34%	0.00%	73.0%	86.7%	72.4%	91.1%	0.6%	4.0%
VMFH St. Michael	872	998	3.5%	3.5%	0.36%	0.53%	77.4%	72.8%	84.9%	84.7%	3.8%	2.0%
VMFH Virginia Mason	446	380	4.6%	3.4%	0.48%	0.87%	75.6%	80.3%	92.9%	78.6%	8.3%	4.7%
All COAP	**13969**	**16338**	**4.3%**	**3.3%**	**0.51%**	**0.44%**	**64.7%**	**70.1%**	**65.2%**	**76.4%**	**12.0%**	**7.7%**

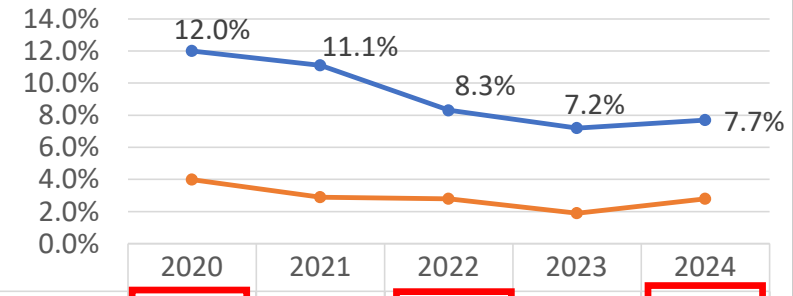
**No PCIs performed in 2020*

Goal 1: Increase Rates of Radial Access for STEMI by 10% within 1 year



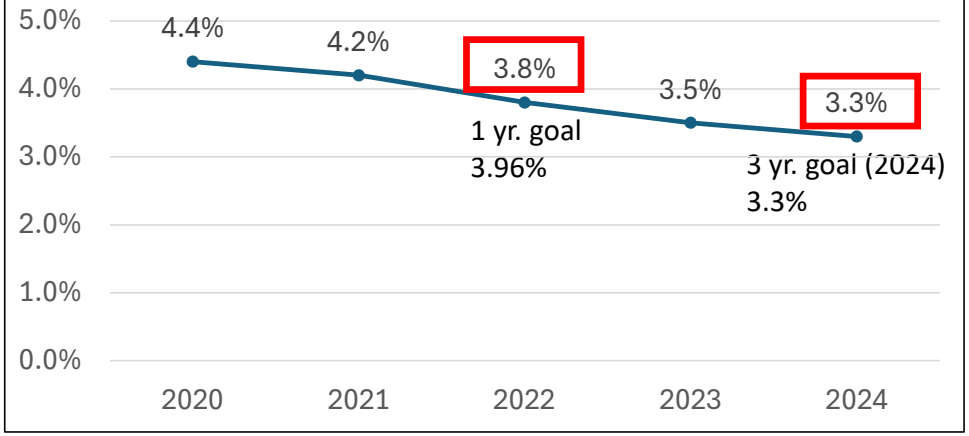
	2020	2021	2022	2023	2024
STEMI	65.2%	71.9%	75.7%	76.5%	76.4%
ALL PCI	64.7%	67.1%	70.2%	70.8%	70.1%

Goal 2: Decrease Routine Use of GP IIb/IIIa Inhibitors by 5% within 1 year

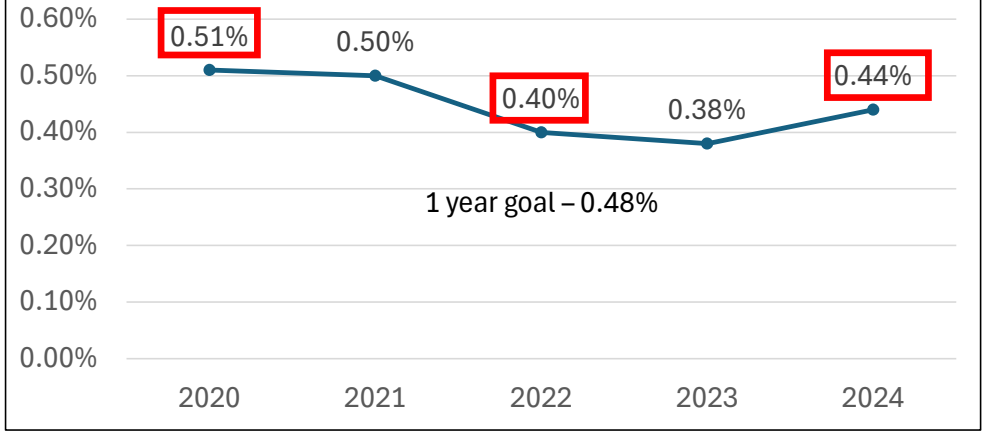


	2020	2021	2022	2023	2024
GP IIb/IIIa	12.0%	11.1%	8.3%	7.2%	7.7%
Direct Thrombin Inhibitors	4.0%	2.9%	2.8%	1.9%	2.8%

Decrease Rates of Risk Adjusted Bleeding by 10% within 1 year and 25% within 3 years, GOAL #3



Goal 4: Decrease Post-PCI Transfusions by 5% within 1 year



COAP PCI Bleeding Reduction Initiative Report Card			
GOALS	Baseline	2024	Grade
Increase rates of radial access for STEMI by 10% within 1 year	65.2%	76.4%	A
Decrease routine use of GP IIb/IIIa inhibitors by 5% within 1 year	12.0%	7.7%	A-
Decrease rates of risk adjusted post-PCI bleeding by 10% within 1 year and 25% within 3 years	4.4%	3.3%	A
Decrease post-PCI transfusion (within 72 hours) by 5% within 1year	0.51%	0.44%	B

As you can see, while significant improvements have been made to reduce bleeding events across our region there is continued need for quality improvement. Please do not let up in your efforts. If you would like support in reducing bleeding rates post PCI, please reach out to Ravi Hira, MD, COAP Medical Director. COAP can connect you to data and educational resources and connect you with clinical teams in hospitals successful in achieving low bleeding rates.

We appreciate your continued efforts!